AMENDMENTS TO THE DRAWINGS

New Figures 7A and 7B are added to the subject application. These figures are FIGS. 18A and 18B in US 2003/0128179 (US 10/278,352) which is incorporated by reference in the subject application in paragraph [03], with the original reference numeral 102 changed to 108 to conform the reference numbers in these figures with those in the original figures in the subject application.

Attachment: One (1) new drawing sheet with FIGS. 7A and 7B.

REMARKS

Applicants have filed a Request for Continued Examination concurrently with this Reply. Applicants respectfully request withdrawal of the finality of the Office Action mailed October 17, 2006 and reconsideration of the rejections set forth therein in view of the amendments made to the claims and the following remarks.

Amendments to the Specification and Drawings

Commonly-owned US Patent Application No. 10/278,352, entitled "IMPROVEMENTS TO COLOR FLAT PANEL DISPLAY SUB-PIXEL ARRANGEMENTS AND LAYOUTS FOR SUB-PIXEL RENDERING WITH SPLIT BLUE SUB-PIXELS" and published as US Published Patent Application 2003/0128179, discloses the subpixel repeating group illustrated in FIG. 6 of the subject application. US 10/278,352 is originally incorporated by reference in the subject application in paragraph [03], and paragraph [03] was amended in a prior Reply to include it's published application document US 2003/0128179.

Applicants have amended the specification of the subject application by adding FIGS. 18A and 18B (as FIGS. 7A and 7B herein) and substantially all of the content of paragraphs [0020], [0026], [0027] and [0028] and [0031] from the published application document (corresponding to paragraphs [020], [026], [027] and [031] in the originally filed application document), with changes needed (e.g., references to figure numbers and reference numbers) to make these added paragraphs consistent with references in the subject application.

Applicants believe that this added material does not introduce new matter into the specification.

Amendments to the Claims

Claims 1 - 27 were pending prior to entry of this amendment, including independent claims 1, 6, 8, 13, 15, 20 and 27. New claims 28 and 29 have been added.

Independent claims 1, 6, 8, 13, 15, 20 and 27 have been amended. These amendments are believed to merely state what was implicit in the claim language before and so are believed to be cosmetic in nature and not intended to limit or narrow the scope of the claims or to effect the Doctrine of Equivalents as it might be applied to the claims, were they left unamended.

Claims 24 – 26 have also been amended to address the Section 112 rejection, as discussed below.

Claim Rejection under 35 U.S.C. § 112

Claims 24 – 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The Examiner states that the aspect of the invention disclosed in claims 24 – 26 is not consistent with the aspect of the invention disclosed in the specification. Applicants believe that the Examiner has interpreted the language in claims 24 – 26 that reads "boundary of the driver chip" to mean that a boundary of the driver chip may occur at a top or bottom of the portion of the panel driven by a particular driver chip, in which case the parasitic effects would be placed upon the subpixels disposed along a row of the portion of the panel. The Examiner reproduces a portion of FIG. 3 of Applicant's application and shows an area labeled "Group A" indicating a row of subpixels at the top of the portion of the panel driven by driver chip B.

FIG. 3 in the subject application illustrates that parasitic effects may occur on the panel where subpixels located at the right edge of a first driver chip (e.g., driver chip A in FIG. 3) are adjacent to subpixels located at the left edge of the next driver chip e.g., driver chip B in FIG. 3.) The locations of the affected subpixels are illustrated by circles around groupings of subpixels in FIG. 3. Some of these groupings do occur at the top or bottom boundary of the driver chip. However, the

common feature of these affected subpixels is that they are disposed in columns positioned at the boundary between driver chips, and claims 24 – 26 have been so amended.

In view of the amendments to claims 24 - 26 and the foregoing remarks, Applicant respectfully submits that the above Section 112 rejection has been overcome.

Claim Rejections under 35 U.S.C. § 103(a)

Claims 1, 2, 6, 8, 9, 13, 15, 16, 20, 22, 23 and 27 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (US 6,326,981, hereafter referred to as "Mori") in view of Okuzono et al. (US 6,727,878, hereafter referred to as "Okuzono").

The undersigned first thanks the Examiner for the extensive and helpful discussion of Applicants' arguments presented in the prior Reply.

The Mori reference.

The Examiner has explained that FIG. 15 in Mori teaches the language of claims 1, 8 and 15 of "a subpixel repeating group having an even number of subpixels in a row direction" because a panel having the subpixel configuration of the panel shown in Fig. 15 includes the subpixel grouping of BGGB in a first row and BRRB in a second row, shown in heavy dashed lines in the reproduced figure below, and this subpixel grouping is repeated down the panel.

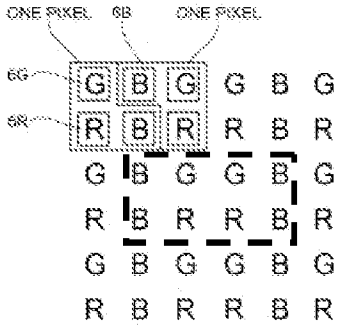


FIG. 15

Applicants accept, for purposes of replying to the Section 103 rejection of Mori and Okuzono in this Office Action, the Examiner's interpretation of the claim language in all independent claims 1, 6, 8, 13, 15, 20 and 27 as it applies to the Mori reference. That is, for purposes of replying to this specific Section 103 rejection, Applicants accept that the display panel shown in FIG. 15 of Mori includes a group of subpixels that may be described as "a subpixel repeating group having an even number of subpixels in a first direction."

Polarity schemes as described in Applicants' specification.

The subject application, at paragraphs [014] - [016] and in FIGS. 1A and 1B, illustrates a conventional RGB stripe subpixel structure on a display panel for an Active Matrix Liquid Crystal Display (AMLCD) having thin film transistors (TFTs) to activate individual colored subpixels. FIG. 1A illustrates a conventional 1 x 1 polarity scheme applied to the panel, and FIG. 1B illustrates a conventional 1 x 2 polarity scheme applied to the panel, in which the polarity changes every two rows. It is well known in the art that polarity schemes are used to reduce or eliminate crosstalk or flicker or other image defects on the display panel.

The subject application notes, in paragraph [016], the following observations when a conventional polarity scheme is applied to display panel substantially comprising an odd-numbered subpixel repeating group, such as an RGB stripe display panel: (1) in 1 x 1 dot inversion, every two physically adjacent subpixels (in both the horizontal and vertical direction) are of different polarity; (2) in 1 x 2 dot inversion, every two physically adjacent subpixels in the horizontal direction are of different polarity; and (3) across any given row, each successive subpixel has an opposite polarity to its neighbor. Thus, for example, two successive red subpixels along a row will be either (+,-) or (-,+).

The subject application then notes that applying either one of the conventional polarity schemes to a display panel substantially comprising a subpixel repeating group having an even number of subpixels in a first direction causes one or more of these observations to be violated. FIG. 2, for example, illustrates a 1 x 1 polarity

scheme applied to a subpixel repeating group having four subpixels in a row direction. the third property described above that results from applying a conventional polarity inversion scheme to an RGB striped panel (i.e., that successive colored pixels in a row and/or column have different polarities) is now violated. Thus, violating any one or more of these observations by applying a conventional polarity scheme to such a panel is an example of how visual defects or artifacts in the image (i.e., image degradation or parasitic effects) displayed on the panel may be introduced.

Applicants' specification discusses various techniques for reducing or eliminating image degradation introduced by image signals having a polarity scheme to a display panel substantially comprising a sub-pixel repeating group having an even number of sub-pixels in a first direction.

The independent claims have been amended to include the phrase "introduced by" to make explicit what was believed to be already implicit in the claim language. For example, claim 1 has been amended to read "a driver circuit sending signals indicating image data having a polarity scheme to the panel; wherein any image degradation introduced by said signals is localized on said column of dark colored subpixels."

Teachings of the Okuzono reference as applied to the display panel in FIG. 15 of Mori.

Okuzono is cited in the Office Action for its teaching of a liquid crystal display that is driven with data signals having specific polarities. For example, various figures illustrate timing charts showing the operation of a liquid crystal display according to different embodiments of polarity schemes such as two line dot inversion (e.g., FIGS. 2, 3, 5, 7 and 10) and three line dot inversion (e.g., FIGS. 6 and 8), referred to in Okuzono as "Multiple Line Dot Inversion Drive." See Okuzono at col. 7, lines 63 – 66.

In a piror Reply, Applicants argued that Okuzono teaches away from localizing any image degradation introduced by image signals having a polarity scheme on dark colored subpixels because Okuzono's driving method was concerned with eliminating

horizontal striping from a display and not localizing the striping from the display. Thus, a person of ordinary skill would not look to Okuzono for a teaching as to how to localize any image degradation.

The Final Office Action explains that "the Examiner didn't interpret Okuzono's horizontal striping as the image degradation disclosed in the claims. For the asserted combination of Mori and Okuzono, the Examiner has merely adopted Okuzono's driving method in Mori in order to prevent the horizontal striping. Office Action, pg. 3.

The prior Office Action (mailed 5/4/2006) acknowledges that Mori modified by Okuzono does not expressly disclose any image degradation of said signals being localized on a column of dark colored subpixels, as required in claim 1. (5/4/2006 Office Action, page 4.) But the Office Action further stated that

> by adopting Okuzono's method of applying polarities to the subpixels in Mori, the signals with the same polarity are applied to adjacent blue subpixels included in a column, as shown in drawing 2. Since two adjacent blue subpixels are driven with a same polarity, the image (de)gradation only occurs on the blue subpixels while the image (de)gradation does not occur on any other subpixels having different colors (i.e. red or green) since red or green subpixels are not adjacent to the subpixels having same colors when they are driven with a same polarity.
>
> Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to [disclose] (have) any image (de)gradation (caused by driving two adjacent subpixels having a same color with a same polarity) in driving signals to be localized on a column of dark colored subpixels (blue subpixels), in Mori as modified by Okuzono.

The present Office Action thus concludes that "the asserted combined device of Mori and Okuzono [interpreted by Applicants as applying Okuzono's driving method to the panel shown in FIG. 15 of Mori] would result in localizing the image degradation on

blue subpixels." Office Action, page 5, emphasis added. The Office Action then states that "it would have been obvious to one of ordinary skill in the art at the time of the invention to use Okuzono's driving method including a two-dot line inversion in Mori since the driving method of Okuzono having two-dot line inversion is one of plural aspects of Okuzono's invention." Office Action, pp. 5 – 6. Applicants interpret the reference to "two-dot line inversion" to mean "two-line dot inversion", as shown in FIG. 2 of Okuzono, also referred to as 1 x 2 dot inversion, where the polarity signal changes every column and every two rows.

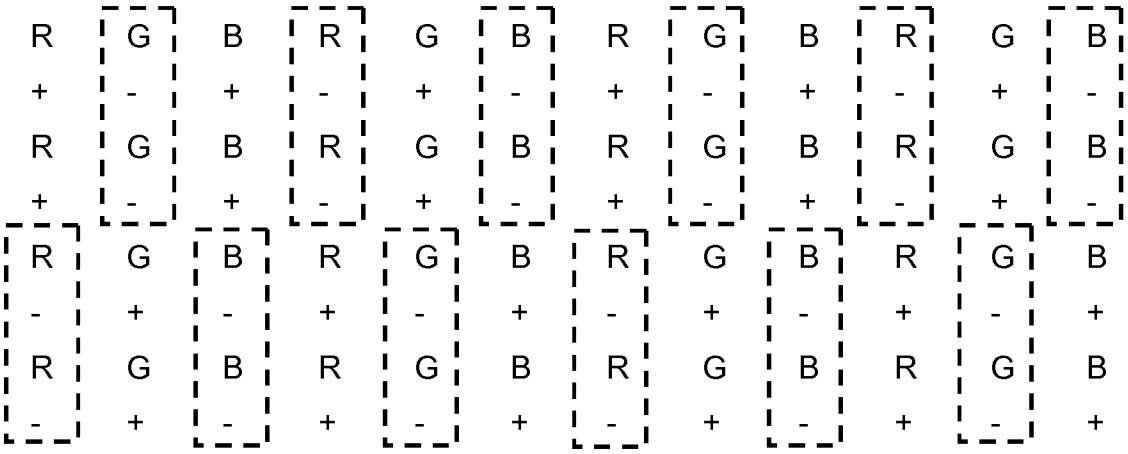
The Office Action includes, at page 9, Drawing 3 which shows the 1 x 2 polarity scheme of Okuzono as illustrated in FIG. 2, for example, applied to the subpixels of the display panel of FIG. 15 in Mori. Applicants have produced a similar illustration below:

G	B	G	G	B	G	G	B	G	G	B	G
+	-	+	-	+	-	+	-	+	-	+	-
R	B	R	R	B	R	R	B	R	R	B	R
+	-	+	-	+	-	+	-	+	-	+	-
G	B	G	G	B	G	G	B	G	G	B	G
-	+	-	+	-	+	-	+	-	+	-	+
R	B	R	R	B	R	R	B	R	R	B	R
-	+	-	+	-	+	-	+	-	+	-	+
G	B	G	G	B	G	G	B	G	G	B	G
+	-	+	-	+	-	+	-	+	-	+	-
R	B	R	R	B	R	R	B	R	R	B	R
+	-	+	-	+	-	+	-	+	-	+	-
G	B	G	G	B	G	G	B	G	G	B	G
-	+	-	+	-	+	-	+	-	+	-	+
R	B	R	R	B	R	R	B	R	R	B	R
-	+	-	+	-	+	-	+	-	+	-	+

One can examine the polarity of the subpixels in the section of the panel reproduced above for violations of observations made in the subject application with respect to conventional polarity schemes: (1) in 1 x 1 dot inversion, every two physically adjacent subpixels (in both the horizontal and vertical direction) are of different polarity; (2) in 1 x 2 dot inversion, every two physically adjacent subpixels in the horizontal direction are of different polarity; and (3) across any given row, each successive same-colored subpixel has an opposite polarity to its neighbor. It can be seen that, in the Mori panel, every two physically adjacent subpixels in the horizontal direction are of different polarity, but across any given row, each successive colored subpixel does not have an opposite polarity to its neighbor. So for example the two successive green subpixels in one of the dashed-line boxes above in Mori's panel have the same polarity, as do the two successive red subpixels in the other dashed-line box. In contrast, successive blue subpixels across a row have opposite polarities (e.g., the blue subpixels have polarities - + - + etc. across a row.) Therefore, any image degradation that may be caused by applying the 1 x 2 polarity scheme of Okuzono to the panel in Mori occurs in the green and red subpixels, and not in the blue subpixels.

The Office Action draws the conclusion that the presence of two vertically adjacent blue subpixels that have the same polarity teach Applicants' claim language in claim 1 of "a driver circuit sending signals indicating image data having a polarity scheme to the panel; wherein any image degradation introduced by said signals is localized on said column of dark colored subpixels." See Office Action, page 9.

Applicants respectfully submit that such a conclusion is erroneous. The polarity scheme of 1 x 2 dot inversion is well-known in the art as being applied to display panels having red, green and blue vertical stripes (i.e., RGB stripe displays), as shown below.



Each of the vertical pairs of adjacent same-colored subpixels in the dashed-line boxes above in a conventional RGB stripe display have the same polarity. The conclusion reached in the Office Action would mean that all RGB stripe displays that are driven with 1 x 2 dot inversion produce image degradation that is localized on every column of same-colored subpixels. Applicants respectfully submit that this is simply not the case.

Applicants request that the Examiner produce a reference that teaches that image degradation is produced when vertically adjacent same-colored subpixels have the same polarity. Inventor Credelle in the subject application is prepared to state in a declaration that such vertically adjacent same-colored subpixels do not produce visual defects or image artifacts that constitute image degradation, and such a declaration will be provided if necessary.

Applicants respectfully submit, therefore, that if applying the 1 x 2 polarity scheme of Okuzono to the panel in Mori introduces image degradation to an image displayed on the panel, such image degradation would occur in the green and red subpixels, and would not be localized to a column of dark subpixels.

Applicants have added new claim 28, which depends from claim 1 and adds the limitation "wherein said driver circuit sends signals indicating image data having a polarity scheme to the panel such that at least two adjacent subpixels in a row have the same polarity." It can be seen from the illustration above showing the Okuzono driving method applied to the panel in Mori that no such condition exists: the polarity

scheme does not produce at least two adjacent subpixels in a row having the same polarity. Therefore, claim 28 is patentable over the combination of Mori and Okuzono.

Independent claims 6, 8, 13, 15, 20 and 27 contain language that is different from independent claim 1 and so Applicants submit that these claims may have a claim scope that is different from the claim scope of independent claim 1. However, with respect to the issue of whether image degradation is localized to dark-colored subpixels, same-colored subpixels, or blue subpixels, the Remarks presented above with respect to independent claim 1 apply equally to independent claims 6, 8, 13, 15, 20 and 27.

For the foregoing reasons, the asserted combination of Mori and Okuzono fails to state a *prima facie* case of obviousness with respect to claims 1, 6, 8, 15, 20 and 27. Applicant respectfully requests that this rejection be withdrawn as to these claims and that these claims be passed to allowance. With respect to claims 2 – 5, 9 – 12, 16 – 19, 21 – 26 and 28 – 29, these claims depend from now presumably allowed claims 1, 6, 8, 15, 20 and 27, and are also believed to be in condition for allowance.

Claim Rejections under 35 U.S.C. § 103(a): Mori, Okuzono and Martin

The Office Action rejects claims 3, 4, 10, 11, 17, and 18 under 35 U.S.C. 103 (a) as being unpatentable over Mori and Okuzono as applied to claim 1 above, and further in view of Martin et al., US 6,714,206.

Dependent claims 3, 10 and 17.

The Office Action states that, since the subpixel arrangement in FIG. 15 of Mori does not expressly disclose a checkerboard of red and green subpixels, it would have been obvious to a person of ordinary skill in the art at the time of the invention to adopt Martin's red and green subpixel arrangement in Mori's subpixel arrangement of FIG. 15 to teach the claim limitation of claims 3, 10 and 17.

Applicants refer the Examiner to the Remarks made in the prior Reply, which are incorporated by reference herein. The Martin reference derives its red and green

checkerboard pattern of subpixels from an issued patent that is commonly owned with the subject application by assignee Clairvoyante, Inc. Moreover, as a practical matter, the fact that the vast majority of displays in commercial use today have an RGB stripe subpixel configuration mitigates against finding a motivation to modify the subpixel configuration in Mori as suggested by Martin.

Applicant again respectfully submits that the Examiner is using Applicants' specification as hindsight to make the asserted combination, and no such teaching, suggestion or motivation for making the asserted combination is found in any of the Mori, Okuzono or Martin references.

Dependent claims 4, 11 and 18.

The Office Action references Figure 9 and source driver 106 of Okuzono as teaching the limitation of claims 4, 11 and 18 "wherein the two columns of blue subpixels share a same column driver." The Office Action explains that

> Okuzono teaches that plural pixels in each column are connected to a source driver (source driver 106 in FIG. 9), which indicated that all pixels in all columns share a driver. There is nothing in the claims specifying the characteristics of the column driver and thus precluding the Examiner from interpreting Okuzono's source driver as a column driver.

Office Action, page 6. The Office Action then states that if "sharing a same column driver" is interpreted in a way mentioned in Remarks in the prior Reply, all the pixels sharing a column driver in the invention are to be driven with the same image data, and thus to display the same image, which makes no sense." Office Action, page 6.

Applicants refer the Examiner to the Remarks made in the prior Reply, which are incorporated by reference herein. Applicants again suggest that the Examiner's interpretation of the source driver of FIGS. 1 or 9 of Okuzono would not be interpreted to be a "column driver" by a person of ordinary skill in the art, and that the source driver would comprise a plurality of column drivers. When interpreted in this manner, two columns of blue subpixels sharing a same column driver would indeed be driven

with the same image data, and this would make sense. If the two columns of blue subpixels shown in FIG. 6 of the subject application are viewed as being a single column of blue subpixels having the same size as the red and green subpixels that has been "split" into two columns of smaller blue subpixels, then it is indeed rational to have each pair of columns of blue subpixels be driven with the same image data.

For the foregoing reasons, the asserted combination of Mori, Okuzono and Martin fails to state a *prima facie* case of obviousness with respect to claims 3, 4, 10, 11, 17, and 18. Applicant respectfully requests that this rejection be withdrawn as to these claims.

Claim Rejections under 35 U.S.C. § 103(a): Mori, Okuzono and Nakano

Claim 5, 7, 12, 14, 19, and 21 are rejected in the Office Action under 35 U.S.C. 103 (a) as being unpatentable over the combination of Mori as modified by Okuzono, and further in view of Nakano et al., US Patent Application Publication 2001/0052897.

The Examiner cites Nakano for teaching the principle of applying a correction signal to subpixels (presumably in the display of FIG. 15 in Mori) to adjust or compensate the offset that occurs among three subpixels with different colors when a gray scale level of any 6-bit data is applied to the subpixels, referring to Fig. 2 and paragraph 0041 of Nakano.

The Office Action then states that "it would have been obvious to one of ordinary skill in the art at the time of the invention to include Nakano's method / principle of applying correction signals to the subpixels which have relatively low luminance values in Ikeda, in order to equalize the luminance value of a subpixel with a color with the luminance value of another subpixel with a different color, thus to provide an image with more precise brightness for the display." Office Action at page 8 – 9.

Dependent claims 5, 7, 12, 14, 19, 21 include the limitations of and depend from now presumably allowable claims 1, 6, 8, 13, 15 and 20 and so are believed to be

in condition for allowance. At this time , Applicants defer presenting any arguments with respect to the teachings of the Nakano reference.

Conclusion

Applicants believe that the Office Action fails to state a *prima facie* case of obviousness with respect to independent claims 1, 6, 8, 13, 15, 20 and 27, and request that the rejections be withdrawn.

Applicant therefore respectfully submits that all pending Claims are patentable over the cited art of record and are in condition for allowance. Therefore, Applicant requests the Examiner to reconsider and withdraw the outstanding rejections and pass this application to allowance.

If the Examiner believes a telephone conference would expedite the allowance of the claims, the Examiner is invited to contact Judith C. Bares at (707) 824-2486.

Respectfully submitted,

/Judith C. Bares/

Judith C. Bares Reg. No. 35,824

Dated: March 16, 2007

Attachment: One (1) new drawing sheet with FIGS. 7A and 7B.